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EXAMINER

BRUTUS, JOEL F

ART UNIT	PAPER NUMBER
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3768

MAIL DATE	DELIVERY MODE
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04/09/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/592,024	Applicant(s) NILSSON ET AL.	
	Examiner JOEL F. BRUTUS	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 12-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/7/06 and 12/12/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group II claims 12-22 in the reply filed on 2/22/2010 is acknowledged. The traversal is on the ground(s) that the examiner assertion of claims 12-22 which employ a mobile terminal and a telecommunication network that are part of claims 1 and 23 and applicant argues that independent claim 12 does not required a mobile terminal capable of transmitting data over a telecommunication network. This is not found persuasive because Group I is drawn to a method of determining the influence of microcirculation by administering acetylcholine or sodium nitroprusside using ionphoresis and by illuminating the tissue with polarized light; whereas Group 1 is drawn to a system for determining microcirculation of a living tissue by illuminating a tissue surface with polarized light. The system as claimed in Group II determines microcirculation of tissue regardless of administering vasoactive agents such as acetylcholine or sodium nitroprusside and does not concern with the influence of such agents.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claim 13 recites the limitation "the vasodilatation" in line 2. There is insufficient antecedent basis for this limitation in the claim, because claim 12 which claim 13 depends on; does not include the word "vasodilatation"

4. Claims 14-15 recite the limitation "said illuminating light" in line 2. There is insufficient antecedent basis for this limitation in the claim, because claim 12 which claims 14-15 depend on; does not include the word "illuminating light"

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12-15 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zinser et al (US Pat: 5,620,000) in view of Gardin et al (US Pat: 4,913,159) and further in view of Wunderman et al (US Pat: 6,122,042) or Crutchfield et al (Pub. No.: US 2002/0091320).

Regarding claim 12, Zinser et al teach a method for measuring the flow rate of a liquid, particularly of blood that is pertinent to the claimed invention. Zinser et al teach polarized laser source particularly laser diode, a polarizer; detecting backscattered or reflected light from object, information concerning distribution of flow rate can be obtained [see column 7 lines 48-67]. Zinser et al further teach polarizing filter [see

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column 12 lines 15-19] that is capable of illuminating a tissue surface with polarized light (emphasis added).

Zinser et al also teach a detector for measuring light intensities of reflected light beams [see column 4 lines 1-15]. Zinser et al further teach a computer 32 and electronic monitoring control system 34 for analyzing detected light intensities to obtain flow rate values [see column 5 lines 49-55]. The computer collects a matrix MxN measured values [see column 5 lines 59-62] and a second matrix MxN of measured values which are subject to FFT Fourier transform [see column 8 lines 52-57]. Zinser et al also disclose matrices can be displayed on the screen of computer 32 as an image which represents the flow rate (thus microcirculation, emphasis added) [see column 7 lines 10-17].

With regards to photosensitive array, applicant discloses it may be a digital camera that is capable of converting incoming light onto digital values or sensor connected to A/D converter may be used [see 0010, specification].

Although Zinser et al don't mention photosensitive array; they convert light intensities into digital values inherently since it is well known in the art that computers use digital values (emphasis added) and as disclosed above computer 32 generates and displays data matrix of flow rate as an image [see above].

Zinser et al don't mention displaying data matrix in a specific color representing microcirculation.

However, Gardin et al teach color Doppler blood flow imaging wherein the velocity of blood flow in a vessel or through an orifice is represented by color images on

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a display with different colors representing different velocities and different directions [see column 1 lines 10-14]. Gardin et al teach displaying flow velocity with different shades of red and blue and a white color indicates the immobile portions (or constriction, emphasis added) [see column 10 lines 1-23]. Gardin et al further teach pixel information transmitted to color display monitor 132 [see column 8 lines 1-6].

Wunderman et al also disclose one or more analog to digital (A/D) converters [see column 11 lines 63-64], a photodetector array 34 [see fig 1A] and a signal processor 40 [see fig 1A] that are capable of converting light energy onto digital values (emphasis added).

Crutchfield et al teach the signal from the probe may be converted to digital form by an analog-to-digital converter [see 0084].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Zinser et al with Wunderman et al by using the A/D converters and signal processors for convenience and combine Zinser et al with Gardin et al by using red or blue to represent blood flow or velocity; for the purpose of increasing visualization and combine Zinser et al with Wunderman et al or Crutchfield et al by using the photodetector array and the A/D converting to convert light energy into digital values; because it is computer compatible and convenient.

Regarding claims 14-15, all other limitations are taught as set forth by the above teaching.

Zinser et al teach in fig 1 device 22 is polarization-sensitive such that only reflected light which is linearly polarized in a direction which is rotated by 90 degree. The polarization direction of the reflected light is rotated by 90 degree compared to the polarization direction of the laser source [see column 7 lines 52-65]. The polarization direction can be parallel and orthogonal since it can rotate 90 degree; for example at 90 degree the two directions are parallel and at 45 they are orthogonal (emphasis added).

Regarding claims 20-22, all other limitations are taught as set forth by the above teaching.

With regards to telecommunication network; Applicant discloses network such as a mobile network or a public fixed network, the Internet. The system can be integrated with a mobile communication terminal as details of a mobile telephone, or form separate units combined with local communication links [see 0019, specification].

However, Zinser et al teach computer 32 which is well known in the art to be connected to internet which is capable of transmitting output data matrix and links are normally cable or wireless (emphasis added). It is well known these days mobile telephones can connect to the internet and can communicate with a computer through the internet (emphasis added).

Nevertheless, Crutchfield et al teach their invention includes a system having the capability for a variety of communication mechanisms such as access to the Internet that provides accurate prediction of the future occurrence of vascular disease, vascular

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disease diagnosis, determination of the severity of vascular disease, and/or vascular disease prognosis [see 0110].

Crutchfield et al further disclose their invention can operate by receiving patient vascular data from another location through a receiver or data receiving means, transmitting the data into a computer or through several computers, comparing the patient's vascular data to the database to produce one or more results and transmitting the data to a computer in a remote location [see 0111].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Zinser et al with Crutchfield et al by using internet to transmit diagnostic data to a remote location; for the purpose of providing accurate prediction of the future occurrence of vascular disease [see 0110, Crutchfield et al].

Regarding claim 13, all other limitations are taught as set forth by the above teaching.

Zinser et al don't teach image of vasodilatation or constriction colored or shaded.

With regards to vasodilation and vasoconstriction; Applicant discloses administer vasoactive agents such as acetylcholine, sodium nitroprusside, determine the effect on microcirculation and output data matrix as an image of vasodilation and vasoconstriction [see 0011, specification].

However, Crutchfield et al teach administering vasoactive drug and used an assessment method such as calculating a pulsatile index to determine the effect of the

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drug and condition of a blood vessel [see 0056-0060, 0080, 0192]. Crutchfield et al also teach the presence of vasodilators and/or vasoconstrictors in a patient indicating dilation or constriction of an artery [see 0218]. Crutchfield et al further teach processing method that can use color coded to display blood flow characteristics such the presence of a blockage or restriction, or the passage of an embolus through the artery [see 0184].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Zinser et al with Crutchfield et al by using color coding to display an image of dilation or constriction after administering vasoactive drug as taught by Crutchfield et al and according to a scale; for the purpose of diagnosing blood flow with accuracy and with an increased visualization.

7. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zinser et al (US Pat: 5,620,000) in view of Gardin et al (US Pat: 4,913,159) and further in view of Wunderman et al (US Pat: 6,122,042) or Crutchfield et al (Pub. No.: US 2002/0091320) as applied to claim 12 above and further in view of Nakakuki (Pub. No.: US 2004/0208393).

Regarding claim 17, all other limitations are taught as set forth by the above teaching.

Zinser et al don't mention matrix employing difference of values of matrix representing red and green divided by the sum of corresponding values of data matrix representing red and green.

However, Nakakuki teaches the image data corresponding to red, green and blue may be divided into a group of pixels in a matrix [see 0024] and the luminance for each pixel may be represented as 8-bit data. In this case, the luminance of each pixel in the image data is converted into a numerical value on a scale of 0-255 [see 0024].

Therefore, one with ordinary skill in the art at the time the invention was made would have motivated to combine Zinser et al with Nakakuki by using the above teaching of Nakakuki; for the purpose of increasing visualization.

Regarding claims 16 and 18, all other limitations are taught as set forth by the above teaching.

Zinser et al don't teach normalization of values of data matrixes and compensating for tissue color.

With regards to normalization of data matrixes and compensating for tissue color; Applicant discloses normalization of the color data matrixes by dividing each color value in the original data matrixes by the average value for the same color representation in the reference area, thereby compensating for fluctuations in flash or continuous light intensity [see 0032, specification].

However, Nakakuki teaches the image data corresponding to red, green and blue may be divided into a group of pixels in a matrix [see 0024].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Zinser et al with Nakakuki by dividing each

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color value by the average value of the same color representation; for accuracy and reliability purposes.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zinser et al (US Pat: 5,620,000) in view of Gardin et al (US Pat: 4,913,159) and further in view of Wunderman et al (US Pat: 6,122,042) or Crutchfield et al (Pub. No.: US 2002/0091320) as applied to claim 12 above and further in view of Takahashi et al (US Pat: 4,366,529).

Regarding claim 19, all other limitations are taught as set forth by the above teaching.

Zinser et al don't mention flexible optical fibers capable of directing light to a body cavity.

However, Takahashi et al teach an illuminating light beam is directed to a portion of the body cavity to be examined through a bundle of optical fibers incorporated in the flexible pipe [see column 1 lines 17-27].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Zinser et al with Takahashi et al by using flexible fiber optics to direct light into a body cavity; in order to minimize thermal damage to the body cavity which may be caused by the illumination.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL F. BRUTUS whose telephone number is (571)270-3847. The examiner can normally be reached on Mon-Fri 7:30 AM to 5:00 PM (Off alternative Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. F. B./
Examiner, Art Unit 3768

/Long V Le/
Supervisory Patent Examiner, Art Unit 3768